the "corrected" PTO-1449 filed with the IDS on Feb. 11, 1999 (the Examiner has initialed the uncorrected version, but not yet the corrected version).

Claims 1, 5, 10 and 23 have been amended in order to address and overcome any p potential issue under Section 112.

The disclosure stands objected to under 35 U.S.C. Section 132, and the claims stand objected to under 35 U.S.C. Section 112, first paragraph. In this regard, the Office Action contends that the subject matter added to claim 1 in the last amendment (i.e., "***only*** a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on the metal-wiring-pattern side . . . ***no*** insulating protective film other than said first insulating protective film covers the metal wiring pattern and the through hole on the metal wiring pattern side") represents "new matter" and was not in the application as originally filed. This rejection is respectfully traversed for at least the following reasons.

***Fig. 1b***, for example and without limitation, of the instant application as originally filed shows ***only*** protective film 30 covering lead 28 and through-hole 25 on the metal wiring pattern side. This is what applicant is claiming, and it cannot possibly represent "new matter" because it was in the application as originally filed. In addition, the instant specification explains at page 41, lines 19+, that "since the formation of the solder resist is made ***only once***, the number of days in manufacturing the tape carrier 23 can be shortened by one day, as compared with the case in which the formation of solder resist is carried out twice. . . " (emphasis added). Thus, in addition to the drawings as filed, the text of the application as filed also emphasizes the advantage of providing only

one protective film over lead 28 on the metal wiring pattern side. The application as filed clearly support this aspect of the instant claimed invention.

Claims 1, 2, 4, 6, 7, 9-11, 13, 15, 18, 19 and 23 stand rejected under 35 U.S.C. Section 103(a) as being allegedly anticipated by the admitted prior art (APA). Referring to APA Fig. 7a, the Office Action contends that "no insulating film other than [film 111] covers the metal wiring pattern and the through hole on the metal wiring patter side." This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires, *inter alia*, "**only** a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on the metal-wiring-pattern side, at locations over and proximate the through hole . . . wherein **no** insulating protective film other than said first insulating protective film covers the metal wiring pattern on the metal wiring pattern side proximate the through hole. . . wherein the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof." For example and without limitation, see Fig. 1(b) of the instant application, where **only** solder resist film 30 covers the wiring pattern 28 on the metal-wiring-pattern side of the tape proximate or near through-hole 105. No other protective film is provided over wiring pattern 28 near through hole 25.

In direct contrast to the inventions of claim 1, APA Figure 7 utilizes two solder resist films 110 and 111 to cover the wiring pattern proximate through hole 105. Thus, claim 1 cannot possibly be met by Figure 7. In fact, APA Figure 7 teaches directly away from the instant claimed invention by requiring two separate solder resist films. Moreover, the structure of Figure 7 is problematic because epoxy solder resist 110 is very

hard (young's modulus of 380 kgf/mm$^2$); thus rendering APA Fig. 7 inferior to the invention of claim 1 (i.e., resist 110 has a young's modulus much higher than the range required by claim 1). The problems with this are discussed at length in the instant specification. Citation to additional art cannot overcome the fundamental flaws associated with prior art Figure 7.

Moreover, claim 1 (as well as claims 10 and 23-27) now require that the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof. The APA instant application teaches an epoxy-based solder resist 110 for preventing bleeding (pg. 2, second paragraph; and pgs. 12-13). In contrast, it has surprisingly been found that by adding the claimed filler amount to the solder resist, the occurrence of bleed can be reduced and/or suppressed without necessarily needing an epoxy-based resist (e.g. pg. 28, last paragraph). However, it is necessary to control the filler amount and keep it within the claimed range in order to achieve this surprising advantage. This is clearly a surprising and unobvious result that can be achieved through the use of the claimed filler amount. In contrast, Miyamura teaches a very broad range of filler, but does not disclose or suggest either the claimed range, or the surprising results which can be achieved via the claimed range. Accordingly, the claimed range patentably defines over the cited art.

Other claims define over the APA for similar reasons.

The Examiner apparently acknowledges that the aforesaid Section 103(a) rejection of claims based solely on the APA may lack merit (see Office Action, pg. 13, last two paragraphs). Thus, an alternative ground of rejection is made.

Claims 1, 2, 4, 6, 7, 9-11, 13, 15, 16, 18-19 and 23 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over APA Fig. 7 in view of Tajima (newly cited). See pages 13-15 of the Office Action. This §103(a) rejection is respectfully traversed for at least the following reasons.

APA Fig. 7 utilizes two different resist films 110 and 111 proximate through hole 105. The Figure 7 structure is problematic because film 110 is very hard and has a Young's modulus of 380 kgf/mm$^2$. In other words, film 110 has a Young's modulus much higher than that required by claim 1. The APA teaches, on page 3 of the instant application, that this high modulus enables film 110 to play "two roles for preventing the occurrence of bleed." Thus, APA Figure 7 desires and requires a film 110 with such a high Young's modulus; thereby teaching away from the instant claimed invention.

In contrast, the instant specification explains in detail why the Young's modulus range required by claim 1 is advantageous over the prior art. *Unexpected results* are associated with the claimed Young's modulus.

Tajima illustrates a single "flexible" dry film resist 6 or 7 provided over conductive pattern 4 proximate a slit 2 in underlying film 1. However, Tajima fails to disclose any particular Young's modulus for the resist film. Even if the resist 6 or 7 of Tajima were to be used in APA Fig. 7 (which applicant believes would be incorrect in any event), the claimed Young's modulus in claim 1 would still not be met, nor would the

advantageous results associated therewith. Thus, even citing Tajima, the prior art still fails to disclose or suggest the inventions of claim 1, wherein only a single solder resist protective film covers the metal wiring pattern on the metal wiring pattern side of the tape proximate the through hole, where that solder resist protective film has a Young's modulus from 5-70 $kgf/mm^2$. Furthermore, the claimed filler range is also not disclosed or suggested.

New claim 27 states that "the first insulating protective film is made of only one kind of solder resist and contains a filler that determines viscosity thereof in the range of 10 wt% to 40 wt%." E.g., see pg. 52 of the instant specification. Again, the cited art fails to disclose or suggest this aspect of new claim 27.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn and the application passed to issue. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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## VERSION WITH MARKINGS TO SHOW CHANGES MADE

## IN THE CLAIMS

Please cancel claims 3 and 12.

1. (Amended) A tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, said tape carrier package semiconductor device comprising:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape, the metal wiring pattern being provided on a metal-wiring-pattern side of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

on the metal-wiring-pattern side of the insulating tape, only a first insulating protective film for insulating and covering the metal wiring pattern and the through hole [on the metal-wiring-pattern side,] at locations over and proximate the through hole,

on a side of the insulating tape opposite the metal-wiring-pattern side, a second insulating protective film for insulating and covering the through hole[ on the side opposite to the metal-wiring-pattern side], and

resin sealing peripheral portions where the metal wiring pattern and a semiconductor element are connected;

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm$^2$ to 70 kgf/mm$^2$, and wherein on the metal-wiring-pattern side of the insulating tape no insulating protective film other than said first insulating protective film covers the metal wiring pattern [on the metal wiring pattern side] proximate the through hole, and wherein the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof.

5. (Amended) The tape carrier package semiconductor device as defined in claim 1, wherein the periphery of portions at which the tape carrier and the [driving] semiconductor elements have been electrically connected is covered with liquid resin having an insulating property in a manner so as to allow the edge of the liquid resin to make an angle of not more than 70° with the upper surface of the first insulating protective film.

10. (Amended) A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, wherein said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape, the metal wiring pattern being provided on a metal-wiring-pattern side of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

on the metal-wiring-pattern side of the insulating tape, only a first insulating protective film for insulating and covering the metal wiring pattern and the through hole [on the metal-wiring-pattern side] at locations over and proximate the through hole,

on a side of the insulating tape opposite the metal-wiring-pattern side, a second insulating protective film for insulating and covering the through hole[ on the side opposite to the metal-wiring-pattern side], and

resin for sealing periphery portions at which the semiconductor device and the metal wiring pattern are connected,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm$^2$ to 70 kgf/mm$^2$, and wherein on the metal-wiring-pattern side of the insulating tape only the first insulating protective film insulates and covers the metal wiring pattern proximate the through hole[ on the metal wiring pattern side], and the solder resist of the first insulating protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof.

23. (Amended) A tape carrier package semiconductor device comprising:

an insulating tape,

a metal wiring pattern on one surface of the insulating tape, the metal wiring pattern being provided on a metal-wiring-pattern side of the insulating tape

a through hole provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

on the metal-wiring-pattern side of the insulating tape, only a first insulating solder resist protective film for insulating and covering the metal wiring pattern and the through hole[ on the metal-wiring-pattern side], and

on a side of the insulating tape opposite the metal-wiring-pattern side, a second insulating solder resist protective film for insulating and covering the through hole[ on the side opposite to the metal-wiring-pattern side],

wherein the first and second insulating solder resist protective films are made of solder resist whose young's modulus is in the range of 5 $kgf/mm^2$ to 70 $kgf/mm^2$, and on the metal-wiring-pattern side of the insulating tape no insulating solder resist other than said first insulating solder resist protective film covers the metal wiring pattern near the through hole[ on the metal wiring pattern side], and

wherein the solder resist of the first protective film includes a filler in the range of 10 wt% to 40 wt% that determines viscosity thereof.

Please add the following new claims:

24. (New) A tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 $kgf/mm^2$ to 70 $kgf/mm^2$, and

wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

25. (New) A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 $kgf/mm^2$ to 70 $kgf/mm^2$, and

wherein the solder resist of the first insulating protective film contains a filler that determines the viscosity thereof in the range of 10 wt% to 40 wt%.

26. (New) A tape carrier package semiconductor device, which has a tape carrier and semiconductor elements that have been packaged on the tape carrier, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm$^2$ to 70 kgf/mm$^2$, and

wherein the first insulating protective film is made of solder resist of one kind, and the solder resist contains a filler which determines viscosity thereof in a range of 10 wt% to 40 wt%.

27. (New) A liquid crystal panel display, which is provided with a liquid crystal panel and a tape carrier package semiconductor device having a tape carrier and semiconductor elements that have been packaged on the tape carrier so as to drive the liquid crystal panel, characterized in that said tape carrier comprises:

an insulating tape,

a metal wiring pattern installed on one surface of the insulating tape,

a through hole that is provided in a manner so as to penetrate the insulating tape so that the insulating tape is allowed to bend,

a first insulating protective film for insulating and covering the metal wiring pattern and the through hole on a metal-wiring-pattern side of the tape,

a second insulating protective film for insulating and covering the through hole on the side opposite to the metal-wiring-pattern side,

wherein the first and second insulating protective films are made of solder resist whose young's modulus is in the range of 5 kgf/mm$^2$ to 70 kgf/mm$^2$, and

wherein the first insulating protective film is made of only one kind of solder resist and contains a filler that determines viscosity thereof in the range of 10 wt% to 40 wt%.